



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,545	09/15/2003	Kenji Samoto	117107	9059
25944	7590	03/21/2008	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850				FIDLER, SHELBY LEE
ART UNIT		PAPER NUMBER		
2861				
			MAIL DATE	DELIVERY MODE
			03/21/2008	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/661,545	SAMOTO, KENJI	
	<b>Examiner</b>	<b>Art Unit</b>	
	SHELBY FIDLER	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 07 January 2008.  
 2a) This action is **FINAL**.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-23 is/are pending in the application.  
 4a) Of the above claim(s) 3,6,9,15,16 and 18 is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1,2,4,5,7,8,10,11,13,14 and 19-23 is/are rejected.  
 7) Claim(s) 12 and 17 is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 15 September 2003 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____ .                                    |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/15/03 &amp; 6/21/07</u> .                                   | 6) <input type="checkbox"/> Other: _____ .                        |

**DETAILED ACTION**

*Election/Restrictions*

Applicant's election with traverse of Species IA in the reply filed on 1/7/2008 is acknowledged. The traversal is on the ground(s) that the subject matter is sufficiently related, such that a search for any one species would encompass a search for the subject matter of each remaining species. This is not found persuasive because, as shown in the Restriction Requirement dated 12/7/2007, a search for a single species does not necessarily encompass a search for any other species (e.g. a cam does not necessarily comprise a screw). Therefore, the requirement is still deemed proper and is made FINAL.

Claims 3, 6, 9, 15, 16, and 18 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the replies filed on 10/3/2007 and 1/7/2008.

*Priority*

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

*Information Disclosure Statement*

The information disclosure statements (IDS) submitted on 9/15/2003 and 6/21/2007 have been considered by the examiner.

*Specification*

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Image Recording Apparatus and Carriage with Adjustable Recording Head Supporting Points.

*Claim Objections*

Claim 2 is objected to because of the following informalities: please change "the adjusting device" (line 4 of the claim) to "the at least one adjusting device" to provide proper antecedent basis for this limitation. A similar objection applies to claims 7, 8, and 20.

Appropriate correction is required.

Claim 22 is objected to because of the following informalities: please add a colon to the phrase "the carriage comprising" (end of line 9 of the claim) to place the claim in proper sentence format. Appropriate correction is required.

*Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

- (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Art Unit: 2861

Claims 1, 5, 7, 8, 22, and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Kelley et al. (US 6663302 B2).

**Regarding claim 1:**

Kelley et al. disclose a carriage (carriage 24) for supporting a recording head (inkjet cartridge 16) such that a clearance is present between the recording head and a recording medium (Figs. 3-4), the carriage being reciprocated in a reciprocating direction intersecting a feeding direction in which the recording medium is fed (col. 3, lines 45-48 & Fig. 1), the carriage comprising:

a plurality of supporting portions having respective supporting points where the supporting portions engage and support the recording head (plurality of supporting points are inherent to the disclosure of Figs. 2-4); and

at least one adjusting device (movable contact actuators 34, 36) which moves the supporting point of at least one of the supporting portions toward, and away from, the recording medium, so as to adjust a degree of parallelism between the recording head and the recording medium with respect to the feeding direction (col. 4, lines 43-58 & Figs. 3-4).

**Regarding claim 5:**

Kelley et al. disclose all the limitations of claim 1, and Kelley et al. also disclose that the carriage (24) comprises a plurality of adjusting devices (46, 48) which move, independent of each other, the respective supporting points of the supporting portions (col. 6, lines 26-38, 49-64).

**Regarding claim 7:**

**Kelley et al.** disclose all the limitations of claim 1, and **Kelley et al.** also disclose that the at least one adjusting device (46, 48) adjusts a height position of the supporting point of the at least one supporting portion (Figs. 3, 4, & 8).

**Regarding claim 8:**

**Kelley et al.** disclose all the limitations of claim 7, and **Kelley et al.** also disclose that the at least one adjusting device (46, 48) comprises a cam (col. 4, lines 62-65) which is for adjusting the height position of the supporting point of the at least one supporting point (col. 4, lines 49-58) where the at least one supporting portion engages and supports the recording head (Fig. 2).

**Regarding claim 22:**

**Kelley et al.** disclose an image recording apparatus (inkjet printer 10), comprising:  
a recording head (inkjet cartridge 16) that records an image on a recording medium (col. 3, lines 42-44);  
a carriage (carriage 24) that supports the recording head such that a clearance is present between the recording head and the recording medium (Figs. 3-4), and which is reciprocated in a reciprocation direction intersecting a feeding direction in which the recording medium is fed (col. 3, lines 45-48 & Fig. 1),

the carriage comprising:

a plurality of supporting portions having respective supporting points where the supporting portions engage and support the recording head (plurality of supporting points are inherent to the disclosure of Figs. 2-4), and

at least one adjusting device (movable contact actuators 34, 36) that moves the supporting point of at least one of the supporting portions toward, and away from the

Art Unit: 2861

recording medium, so as to adjust a degree of parallelism between the recording head and the recording medium with respect to the feeding direction (col. 4, lines 43-58 & Figs. 3-4);

a guide bar (carriage rod 28) that guides the carriage such that the carriage is reciprocated in the reciprocating direction (col. 3, lines 45-50); and

a frame (frame components 12a, 12b) that holds the guide bar (col. 3, lines 48-50), supports the carriage (col. 3, lines 45-50), and cooperates with the guide bar to position the carriage relative to the recording medium (Figs. 2-4).

**Regarding claim 23:**

Kelley et al. disclose all the limitations of claim 22, and Kelley et al. also disclose that the carriage (24) supports the recording head comprising an ink jet recording head (16) that outputs an ink toward the recording medium to record an image on the recording medium (col. 3, lines 42-44).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 4, and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelley et al. (US 6663302 B2) in view of Yamaguchi et al. (US 6554394 B1).

**Regarding claim 2:**

**Kelley et al. disclose** all the limitations of claim 1, and **Kelley et al. also discloses** that the adjusting device (34, 36) moves the supporting point of all supporting portions (Figs. 3-4).

**Kelley et al. do not expressly disclose** that the supporting portions comprise two upstream supporting portions and one downstream supporting portion with respect to the feeding direction.

**However, Yamaguchi et al. disclose** a carriage (carriage 200) comprising a two supporting portions (unreferenced supporting wall shown in Fig. 60 providing a resting spot for projection 415) located at the front of the carriage (Fig. 60) and one supporting portion (e.g. boss 2001 for projection 408) located in the rear of the carriage (Fig. 59).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize the supporting portions disclosed by Yamaguchi et al., so as to produce upstream and downstream supporting portions into the carriage of Kelley et al. One motivation for utilizing such supporting portions, as taught by Yamaguchi et al., is to provide an arrangement that determines the vertical position of the recording head (col. 28, lines 7-16).

**Regarding claim 4:**

**Kelley et al. disclose** all the limitations of claim 1, and **Kelley et al. also disclose** that the carriage has a head accommodating space which accommodates the recording head (Fig. 2), wherein the head accommodating space opens toward a front side of the carriage (Fig. 2).

**Kelley et al. do not expressly disclose** that the head is detachable from the carriage, or that the supporting portions comprise at least one front supporting portion provided in the space, near to the front side of the carriage, and at least one rear supporting portion provided in the space, remote from the front side of the carriage.

**However, Yamaguchi et al. disclose** a carriage (carriage 200) that comprises a head accommodating space which accommodates a recording head (head unit 401 – Figs. 58-62) and at least one front supporting portion (unreferenced supporting wall shown in Fig. 60 providing a resting spot for projection 415) provided in the space, near to the front side of the carriage (Fig. 60), and at least one rear supporting portion (e.g. boss 2001 for projection 408) provided in the space, remote from the front side of the carriage (Fig. 59).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize the supporting portions disclosed by Yamaguchi et al. into the carriage of Kelley et al. One motivation for utilizing such supporting portions, as taught by Yamaguchi et al., is to provide an arrangement that determines the vertical position of the recording head (col. 28, lines 7-16).

**Regarding claim 19:**

**Kelley et al. disclose** a carriage (carriage 24) for supporting a recording head (inkjet cartridge 16) such that a clearance is present between the recording head and a recording medium (Figs. 3-4), the carriage being reciprocated along a guide bar (carriage rod 28) in a reciprocation direction intersecting a feeding direction in which the recording medium is fed (col. 3, lines 45-48 & Fig. 1), the carriage comprising:

at least one through-hole (one of the right-most bearing or left-most bearing disclosed in Figs. 1-2) through which the guide bar extends (Fig. 2);  
a plurality of supporting portions having respective supporting points, where the supporting points engage and support the recording head (plurality of supporting points are inherent to the disclosure of Figs. 2-4); and

at least one adjusting device (movable contact actuators 34, 36) that moves the supporting point of at least one of the supporting portions toward, and away from, the recording medium, so as to adjust a degree of parallelism between the recording head and the recording medium with respect to the feeding direction (col. 4, lines 43-58 & Figs. 3-4).

**Kelley et al. do not expressly disclose** that the plurality of supporting portions comprise at least one hole-side supporting portion that is provided on a side of the at least one through-hole, and at least one opposite side supporting portion that is opposite to the at least one hole-side supporting portion with respect to the recording head.

**However, Yamaguchi et al. disclose** a carriage (carriage 200) comprising a right-side supporting portion (e.g. the unreferenced supporting wall shown in Fig. 60 providing a resting spot for projection 415) and an opposite-side supporting portion (e.g. the boss 2001 for projection 408 – Figs. 58-61).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize supporting portions, such as those disclosed by Yamaguchi et al., so as to provide hole-side and opposite hole-side supporting portions into the carriage of Kelley et al. One motivation for utilizing such supporting portions, as taught by Yamaguchi et al., is to provide an arrangement that determines the vertical position of the recording head (col. 28, lines 7-16).

**Regarding claim 20:**

**Kelley et al. as modified by Yamaguchi et al. disclose** all the limitations of claim 19, and **Yamaguchi et al. also disclose** two right-side supporting portions (the unreferenced supporting wall shown in Fig. 60 providing a resting spot for projection 415, and CR head cam

Art Unit: 2861

241 – col. 30, lines 48-55), and one opposite-side supporting portion opposite to the two left side supporting portions with respect to the recording head (Fig. 63-64); and

**Kelley et al. also disclose** that the adjusting device (34, 36) moves the supporting point of all supporting points (Figs. 3-4).

Examiner notes that, for the purpose of rejection, Kelley et al.'s right-most bearing is taken as the claimed "through-hole".

**Regarding claim 21:**

**Kelley et al. as modified by Yamaguchi et al. disclose** all the limitations of claim 19, and **Yamaguchi et al. also disclose** two right-side supporting portions (the unreferenced supporting wall shown in Fig. 60 providing a resting spot for projection 415, and CR head cam 241 – col. 30, lines 48-55), and one opposite-side supporting portion opposite to the two left side supporting portions with respect to the recording head (Fig. 63-64); and

**Kelley et al. also disclose** that the adjusting device (34, 36) moves the supporting point of all supporting points (Figs. 3-4).

Examiner notes that, for the purpose of rejection, Kelley et al.'s left-most bearing is taken as the claimed "through-hole".

Claims 10, 11, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lim (US 6644765 B2) in view of Numata et al. (US 5870114).

**Regarding claim 10:**

**Lim discloses** a carriage (head carrier 46') for supporting a recording head (printing head 41') such that a clearance is present between the recording head supported by the carriage, and a recording medium (Fig. 2), the carriage being reciprocated in a reciprocating direction

Art Unit: 2861

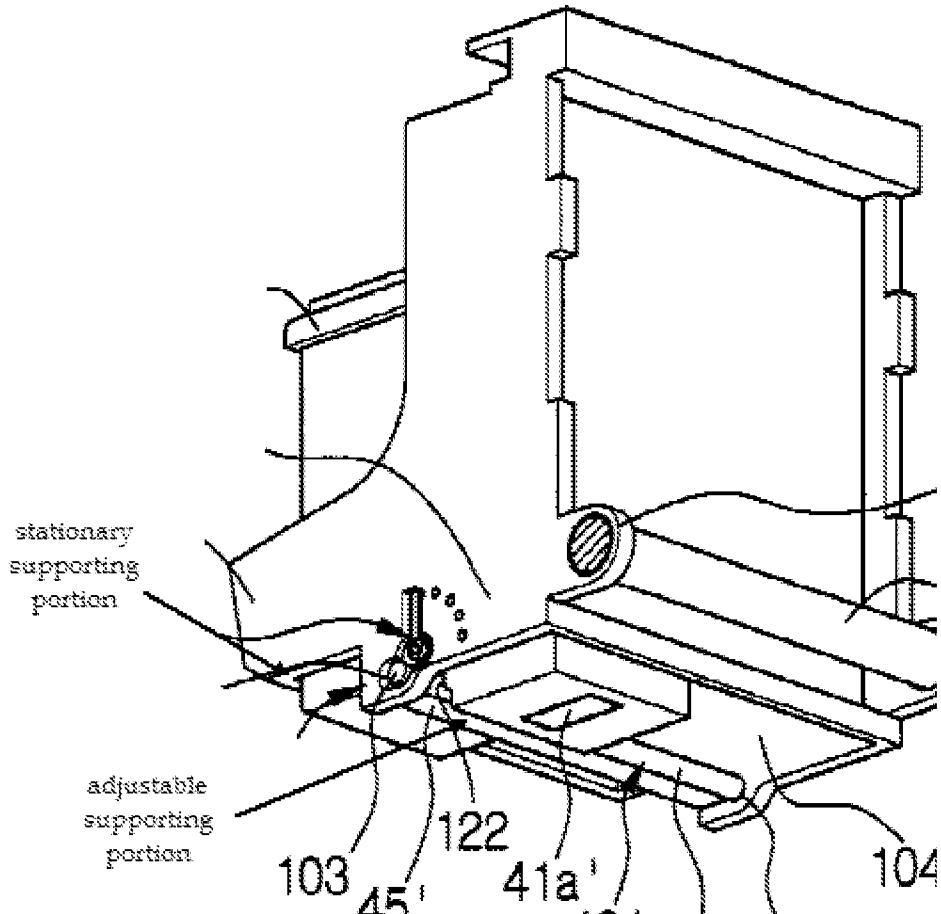
intersecting a feeding direction in which the recording medium is fed (col. 1, lines 31-39), the carriage comprising:

a plurality of supporting portions having respective supporting points where the supporting portions engage and support the recording head (see Drawing A below); and at least one adjusting device (cam 113 + lever 115) that moves the supporting point of at least one adjustable supporting portion (portion of adjustment shaft 102 supporting lower fixing surface 122) of the supporting portions toward, and away from, the recording medium (col. 5, lines 20-30 & Figs. 2 and 6 show that the head 41' is moved toward and away from the paper P in paper feeder 20), the supporting portions further comprising at least one stationary supporting portion whose supporting point is stationary (Drawing A),

the at least one adjustable supporting portion (102) being provided at a rear position of the carriage so as to define a rear clearance between a rear portion of the recording head and the recording medium (Figs. 2 & 5),

the at least one stationary supporting portion being provided at a front position of the carriage so as to define a front clearance between a front portion of the recording head and the recording medium (Fig. 2 & Drawing A),

the at least one adjusting device (100) moving the supporting point of the at least one adjustable supporting portion (102) and thereby adjusting the rear clearance between the rear portion of the recording head and the recording medium (Figs. 2 & 5 show that the clearance between the head 41' and the paper P in paper feeder 20 is changed).



Drawing A: Figure 5 from Lim, edited for clarification of rejection

**Lim does not expressly disclose** that the rear position of the carriage is a downstream position in the feeding direction, or that the front position of the carriage is an upstream position in the feeding direction.

**However, Numata et al. disclose** a carriage (carriage 12) in which the rear position of the carriage is a downstream position in a feeding direction, and that the front position of the carriage is an upstream position in the feeding direction (col. 7, line 36 – col. 8, line 2 & Fig. 1).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize multiple feeding directions, such as disclosed by Numata et al., in which

the front position of Lim's carriage becomes an upstream side of the feeding direction and the rear position of Lim's carriage becomes a downstream side of the feeding direction. One motivation for utilizing such paper feeding, as suggested by Numata et al., is to allow for printing on a manually inserted printing medium (col. 7, lines 52-57).

**Regarding claim 11:**

**Lim as modified by Numata et al. disclose** all the limitations of claim 10, and **Lim also discloses** two side plates (sidewalls 104, 104') that extend perpendicularly to the reciprocating direction (Fig. 1) and cooperate with each other to define a head accommodating space to accommodate the recording head (Fig. 5); and

a support bar (adjustment shaft 102) that extends, at the rear position of the carriage, perpendicularly to the two side plates (Fig. 5) and has opposite end portions that are respectively supported by the two side plates (col. 4, lines 21-27 & Fig. 5);

wherein the support bar supports the at least one adjustable supporting portion (Fig. 5) and the at least one adjusting device (Fig. 5) and thereby adjusts the rear clearance between the rear portion of the recording head and the recording medium (col. 5, lines 20-30).

**Regarding claim 13:**

**Lim as modified by Numata et al. disclose** all the limitations of claim 10, and **Lim also discloses** two front stationary supporting portions (each corner between the front and sidewalls comprises a stationary supporting portion - Drawing A) and one rear adjustable supporting portion (Drawing A).

**Regarding claim 14:**

**Lim as modified by Numata et al. disclose** all the limitations of claim 13, and **Lim also discloses** that the two front stationary supporting portions are provided in a vicinity of the two

Art Unit: 2861

side plates, respectively (Drawing A), and the one downstream adjustable supporting portion is provided at a substantially middle position between the two side plates (Fig. 5).

*Allowable Subject Matter*

Claims 12 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 12 contains allowable subject matter since the prior art of record does not disclose, teach, or suggest a carriage comprising two reinforcing plates that cooperate with each other to support the support bar. It is this limitation, in combination with other features and limitations of claim 12, that makes this claim allowable over the prior art of record.

Claim 17 contains allowable subject matter since the prior art of record does not disclose, teach, or suggest a carriage comprising at least one adjustable supporting portion, wherein the supporting point of the at least one adjustable supporting portion comprises an outer circumferential surface of the cam. It is this limitation, in combination with other features and limitations of claim 17, that makes this claim allowable over the prior art of record.

Examiner notes that Lim discloses an eccentric cam 113 and an adjustment shaft 102. However, Lim's eccentric cam does not directly engage and support the recording head; rather, the cam merely pushes the adjustment shaft into various positions.

Art Unit: 2861

*Communication with the USPTO*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SHELBY FIDLER whose telephone number is (571)272-8455. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on (571) 272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Shelby Fidler/  
Patent Examiner  
AU 2861

/LUU MATTHEW/  
Supervisory Patent Examiner, Art Unit 2861